

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-20 (Cancelled)

21. (New) A fuel cell system which includes a fuel cell; a supply passage that supplies hydrogen gas to the fuel cell; a discharge passage that discharges the hydrogen gas from the fuel cell; at least one valve element which is located in a predetermined portion in at least one of the supply passage and the discharge passage, and which closes off a hydrogen passage in the fuel cell; and control means for performing control that closes the at least one valve element, comprising:

pressure detection means for detecting pressure in the hydrogen passage; and

leak determination means for performing analysis of a change in the pressure detected by the pressure detection means when the at least one valve element is closed by the control means, and determining whether there is leak of the hydrogen gas based on a result of the analysis.

22. (New) A gas leak detection method for detecting hydrogen gas leak in a fuel cell system which includes a fuel cell; a supply passage that supplies hydrogen gas to the fuel cell; a discharge passage that discharges the hydrogen gas from the fuel cell; and at least one valve element which is located in a predetermined portion in at least one of the supply passage and the discharge passage, and which closes off a hydrogen passage in the fuel cell, comprising the steps of:

(a) closing the at least one valve element;

(b) detecting pressure in the hydrogen passage in the fuel cell; and

(c) performing analysis of a change in the pressure detected in the step (b) when the at least one valve element is closed in the step (a), and determining whether there is leak of the hydrogen gas based on a result of the analysis.

23. (New) The gas leak detection method according to claim 22, wherein the step (c) includes the steps of (c-1) obtaining pressure change speeds when the pressure detected in the step (b) reaches two different predetermined levels; and (c-2) comparing both the pressure

change speeds obtained in the step (c-1), and determining that there is the leak when a difference between both the pressure change speeds exceeds a predetermined value.

24. (New) The gas leak detection method according to claim 23, wherein one of the two different levels of the pressure is set to a first pressure range in the vicinity of atmospheric pressure, and the other is set to a second pressure range which is on a high pressure side of the first pressure range.

25. (New) The gas leak detection method according to claim 22, wherein the step (c) includes the steps of (c-1) detecting a minimum pressure value when the pressure detected in the step (b) is lowest; and (c-2) comparing the detected minimum pressure value and a predetermined value, and determining that there is the leak when it is determined that the minimum pressure value is higher than the predetermined value.

26. (New) A fuel cell system comprising:
a fuel cell;
a supply passage that supplies hydrogen gas to the fuel cell;
a discharge passage that discharges the hydrogen gas from the fuel cell;
at least one valve element which is located in a predetermined portion in at least one of the supply passage and the discharge passage, and which closes off a hydrogen passage in the fuel cell;
a controller that performs control of closing the at least one valve element;
a pressure detector that detects pressure in the hydrogen passage; and
a leak determination device that performs analysis of a change in the pressure detected by the pressure detector when the at least one valve element is closed by the controller, and determines whether there is leak of hydrogen based on a result of the analysis.

27. (New) The fuel cell system according to claim 26, wherein
the at least one valve element includes a first valve element located in the supply passage and a second valve element located in the discharge passage.

28. (New) The fuel cell system according to claim 26, wherein
the leak determination device determines whether there is leak of the hydrogen gas when the fuel cell is stopped.

29. (New) The fuel cell system according to claim 26, wherein the leak determination device obtains pressure change speeds when the pressure detected by the pressure detector reaches two different predetermined levels; and compares both the obtained pressure change speeds, and determines that there is the leak when a difference between both the pressure change speeds exceeds a predetermined value.

30. (New) The fuel cell system according to claim 29, wherein each of the two different levels is set to a value that can be reached during a period since the at least one valve element is closed until the pressure detected by the pressure detector, which has decreased, starts to increase.

31. (New) The fuel cell system according to claim 30, wherein one of the two different levels of the pressure is set to a first pressure range in the vicinity of atmospheric pressure, and the other is set to a second pressure range which is on a high pressure side of the first pressure range.

32. (New) The fuel cell system according to 29, the controller forcibly reduces the pressure in the hydrogen passage at a certain time between two time points at each of which the pressure change speed is obtained.

33. (New) The fuel cell system according to claim 32, wherein the controller opens the second valve element at the certain time between the two time points in order to reduce the pressure in the hydrogen passage.

34. (New) The fuel cell system according to claim 32, wherein the controller causes the fuel cell to generate electric power so that the fuel cell consumes the hydrogen gas in the hydrogen passage at the certain time between the two time points in order to reduce the pressure in the hydrogen passage.

35. (New) The fuel cell system according to claim 31, wherein the fuel cell system is installed in a moving object that includes a secondary battery in addition to the fuel cell as a driving source, and the leak determination device obtains, in advance, the pressure

change speed when the pressure is in the second pressure range while operation of the fuel cell is stopped and the moving object is operated using only the secondary battery.

36. (New) The fuel cell system according to claim 29, wherein for the controller applies pressure to the hydrogen passage in the fuel cell, and one of the two different levels of the pressure is set to a first pressure value that can be reached when the controller applies pressure to the hydrogen passage, and the other is set to a second pressure value that can be reached when the controller applies pressure to the hydrogen passage again.

37. (New) The fuel cell system according to claim 26, wherein the leak determination device detects a minimum pressure value when the pressure detected by the pressure detector is lowest; and compares the detected minimum pressure value and a predetermined value, and determines that there is the leak when it is determined that the minimum pressure value is higher than the predetermined value.

38. (New) The fuel cell system according to claim 37, wherein the controller forcibly reduces the pressure in the hydrogen passage at a certain time during a period since the at least one valve element is closed by the controller until the minimum pressure value is detected by the leak determination device.

39. (New) The fuel cell system according to claim 38, wherein for the controller opens the second valve element at the certain time during the period since the at least one valve element is closed by the controller until the minimum pressure value is detected by leak determination device.

40. (New) The fuel cell system according to claim 38, wherein the controller causes the fuel cell to generate electric power so that the hydrogen gas in the hydrogen passage is consumed at the certain time during the period since the at least one valve element is closed by the controller until the minimum pressure value is detected by the leak determination device.

Amendments to the Drawings:

The attached replacement drawing sheets makes changes to Figs. 1, 3 and 6
and replaces the original sheets with Figs. 1, 3 and 6.

Attachment: Replacement Sheets